



U.S. Fish & Wildlife Service

Back Bay National Wildlife Refuge

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Shrub-Scrub Habitat Evaluation

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I. Executive Summary

Conversion of the current shrub-scrub habitats west of Sandpiper Road and north of the Back Bay National Wildlife Refuge, into recreational facilities for a new hotel development, should be avoided due to the large number of negative impacts to local and migrating wildlife resources, the Back Bay National Wildlife Refuge, the Back Bay Watershed, the Town of Sandbridge, and the City of Virginia Beach. Development of this Shrub-scrub habitat will result in, but not be limited to:

- Increased fragmentation of a unique habitat type in this area.
- Disruption of avian migratory routes and traditional breeding areas.
- Local contribution to national and/or State declines of several songbird species.
- Loss of several rare mammalian wildlife species already documented in this area.
- Loss of a vegetative barrier and washover buffer that will lead to increased erosion, and possible creation of a new saltwater inlet between the Atlantic Ocean and the fresh waters of Back Bay.
- Increased recreational use, particularly personal watercraft, that will degrade the water quality and Submerged Aquatic Vegetation (SAV) beds of Back Bay's sensitive ecosystem.
- Loss of an important migratory bird research and educational facility.

Should development of the Shrub-scrub habitats along the western side of Sandpiper Road be approved, solutions to these negative impacts must be addressed if the City is to continue managing its natural resources in a wise and progressive manner. If ignored, these results could cost the city much more than the tax ratables and tourist dollars brought in by this new hotel resort, together with the reason the public would wish to visit this facility.

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II. Introduction

The area under discussion is approximately 35-acres of shrub-scrub habitat along the western side of Sandpiper Road in the southernmost section of the Sandbridge area in Virginia Beach. This habitat is part of what was once a “shrub-scrub chain” along the East Coast. Shrub-scrub habitats typically exist within the ecotone between coastal, sand-dune/beaches, and adjacent western bay marshes. Current plans for this area include removal of the scrub-shrub vegetation for development of proposed hotel recreational facilities and a large resort hotel at the southern end of Sandpiper Road (Appendix #1). If this hotel is constructed as proposed, valuable habitat will be lost from the ecosystem, destabilizing and eroding the local topography, disrupting a Neotropical bird migration route, and quite possibly leading to the local extinction of several rare plant and animal species. Staff at the adjacent Back Bay National Wildlife Refuge (the Refuge/Back Bay NWR) are concerned about the potential loss of this unique and valuable habitat type from the area. The intent of this paper is to articulate these concerns for the benefit of those agencies responsible for reviewing and/or approving the proposed land use changes.

III. Habitat Description and Species Use

Shrub-scrub habitats serve as “refugia” for wildlife, provide storage capacity for groundwater, and help stabilize the soil (Bellis, 1995). When standing on Sandpiper Road, in the Little Island City Park vicinity, one can observe both the undeveloped eastern oceanfront dune complex and the more western shrub-scrub ecotone that borders the western marshes. The western side is stabilized by a buffer of high shrubs and low trees. This area is able to survive ocean wash-overs during “northeasters” and hurricanes with minimal soil losses from erosion. The eastern side has much less vegetation and more loose, unconsolidated sands, that permit greater erosion potential from wind and water.



Photo #1: Typical, dense shrub-scrub habitat consists of a variety of shrubs of various species, ages, and sizes. Migrating songbirds favor this coastal mix.

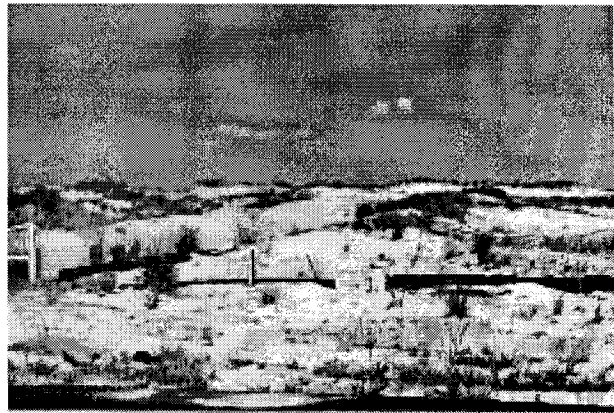


Photo #2: A view along eastern side of Sandpiper Road, overlooking the dune system. Only sparse beachgrass provides ground-cover there.

Typical shrub-scrub vegetation includes Waxmyrtles (*Myrica cerifera* and *M. pennsylvanica*), Live Oak (*Quercus virginiana*), Black Cherry (*Prunus serotina*), Loblolly Pine (*Pinus taeda*), and various other local shrubs and trees, together with underlying grasses, forbs, and other vegetation. This vegetative combination not only stabilizes the surface topography of the area, but also provides a stable understory that is critical for many mammal, reptile, bird, and amphibian species.

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Photo #3: Understory growth within shrub-scrub habitats provides cover for small mammals, reptiles, amphibians, and invertebrates, as well as nesting for songbirds. The vegetation also stabilizes the soil.

Documented wildlife species that use this habitat include: the rare Hoary (*Lasiurus cinereus*) and Silver-haired bats (*Lasionycteris noctivagans*), Seashore mouse (*Peromyscus leucopus easti*), Black-whiskered Vireo (*Vireo altiloquus*), Lark Bunting (*Calanospiza melanocorys*), Audubon's Warbler (*Dendroica coronata*), Least Bittern (*Ixobrychus exilis*), and the second confirmed Seminole bat (*Lasiurus seminolus*) ever found in the State. Some of these species exist in this area's shrub-scrub habitat due to geographical range limits and/or other topographical constraints.

This habitat also serves as a migration pathway for many species of Neotropical songbirds. These birds fly along and through the shrub-scrub line that stretches along the eastern coast of North America to their wintering grounds in Central or South America using the habitat as cover from predators, a constant food source, and resting ground during their migrations. Increased losses of such habitat should contribute to increased songbird mortality during migration.

Refuge Neotropical Songbird Point Counts during 1994-1999, have revealed use by the same species (Ref. Appendix #2) as found at Chincoteague NWR in northern Virginia. The most commonly observed birds within Refuge shrub-scrub habitats (immediately south of the subject area) included the Field Sparrow (*Spizella pusilla*), Song Sparrow (*Melospiza melodia*), Yellow Warbler (*Dendroica petechia*), Fish Crow (*Corvus ossifragus*), and Common Yellowthroat (*Geothlypis trichas*). The Field Sparrow is listed as a declining species in Virginia, and throughout much of the United States. Also found were several raptor species including the Osprey (*Pandion haliaetus*) and Bald Eagle (*Haliaeetus leucocephalus*), and several hawks and owls. According to recent research, 48 songbird species breed in sandy, pine-scrub oak habitat (DeGraaf and Rappole 1995) similar to the area in question. In addition, 101 out of the 355 Neotropical migrants of the East Coast, use such Shrub-scrub habitats to winter in (Ibid 1995).

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IV. Refuge Concerns

A. Shrub-scrub Habitat as Migration Corridors and Biodiversity Reserves

Back Bay National Wildlife Refuge has several concerns relative to loss of environmental conditions and use of the land in question if the hotel complex and associated recreational facilities along the western side of Sandpiper Road are built. Many of these concerns deal with current avian use of the habitat. Studies have determined that disruption of coastal shrub-scrub habitats has added to the national decline of several avian species, including: the Black-billed Cuckoo (*Coccyzus erythrophthalmus*), Brown Thrasher (*Toxostoma rutum*), Prairie Warbler (*Dendroica discolor*), Yellow-breasted Chat (*Ictera virens*), Gray Catbird (*Dumetella carolinensis*), Field Sparrow, Common Yellowthroat, and Eastern Towhee (*Pipilo erythrophthalmus*) (Fernald 1989; Askins 1993; DeGraaf and Rappole 1995). Scientists from the USGS Biological Resources Division, Patuxent Wildlife Research Center in Laurel, Maryland, report that Painted Buntings (*Passerina ciris*), Prairie warblers and Common Yellowthroats “depend on early successional habitat and are found breeding primarily in upland, maritime, shrub-scrub habitat” (Meyers, et al. 1999). U.S. Fish and Wildlife Service Wildlife Biologist Irvin Ailes (Chincoteague National Wildlife Refuge, VA) reported that their shrub-scrub habitat is a significant use area for Neotropical migrants, for both nesting and wintering purposes (04/23/1999, personal communication). His data and reports are included in Appendices #2 and #3. Chincoteague and Back Bay NWRs support nearly identical oceanfront, barrier island habitat types, including shrub-scrub.

Fragmented and disrupted habitats cause resident and migrant wildlife populations to become smaller and isolated, and may result in local extirpation (Fernald, 1989). Habitat loss and fragmentation of shrub-scrub areas have been documented as a cause of the local decline of the above-named species, and have been occurring in coastal Virginia (Ailes, 1998; Simpson, 1999; and Gallegos, 1999) as housing developments. Shrub-scrub habitats provide travel corridors for migratory songbirds and raptors



Photo #4: Shrub-scrub habitat also exists along the powerline right-of-way.

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(hawks, falcons, and owls). Continued loss of this habitat will further disrupt and fragment the coastal migration routes currently used by these birds. This habitat is critical because of the large amount of food therein that is available to migrants during their seasonal movements, and the cover it provides from avian predators. Researchers have reported that migrating songbirds utilize areas containing abundant berries (Brown University News 1997). The fruits of the Waxmyrtle and Bayberry (and resident insects) provide much of the energy and fat reserves required for the long fall and spring migrations (Place and Stiles, 1992).

All of the bats (including the rare species) that use this area are insectivorous and keep local insect pest populations reduced. The Seashore mouse and several other small mammals are also present but are limited to the specific conditions within shrub-scrub habitat. These species not only help control plant growth and insect populations, but also provide food for raptors and reptiles.

Loss of additional shrub-scrub habitat in this area may result in reduced avian use, lower survival rates of migrants, as well as reduced small mammal populations. The combined loss of passerines and small mammals will negatively impact migrating raptor species that depend on birds and small mammals during their long seasonal migrations. Heavy recreational use of the shrub-scrub habitats together with increased traffic on the bay would also negatively impact these birds and mammals, and many reptile and amphibian species including a diverse mix of turtles, snakes, frogs, toads, salamanders, etc.



Photo #5: Low vegetation, such as ferns, also exist in the shrub-scrub. This provides good cover for amphibian and reptile species.



Photo #6: Grape vines (*Vitis spp.*) also flourish within shrub-scrub habitats. They produce fruit for migrating songbirds and mammals to feed upon while also providing cover from predators.

B. Shrub-scrub Habitat as an Erosion Barrier

The Shrub-scrub zone also serves as a vegetative barrier and buffer to ocean winds, storms, heavy rains, and wave action. Loss of this vegetation barrier will increase erosion potential along an already narrow stretch of barrier island. The difference in erosion potential can be seen if one compares Little Island City Park east of Sandpiper Road, with the shrub-scrub habitat to the west. The paved parking areas and sand dunes reveal much greater erosion effects, as evidenced by the amount of sand constantly blowing through the parking lot and the washing away or deposition of sand around walkways and paving.

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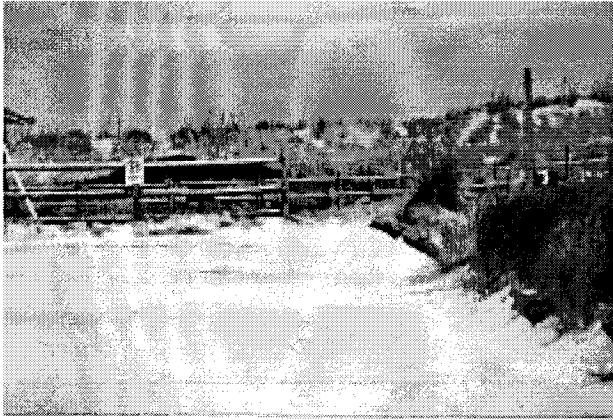


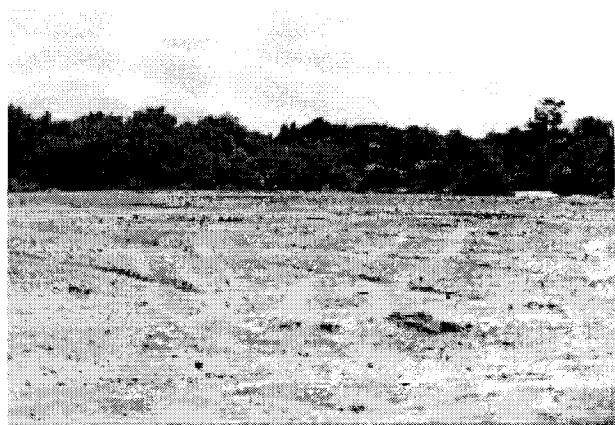
Photo #7: The Little Island City Park parking lot on the eastern side of Sandpiper Road. Grasses are dense around the edges of parking lot. Sand from the dunes is spreading over the parking lot. This area receives little wildlife use.



Photo #8: Typical, dense shrub-scrub habitat consists of a variety of shrubs of various species, ages, and sizes. Migrating songbirds favor this coastal mix.

Bellis' (1995) reported that damage from clearing a right-of-way within a maritime forest/shrub-scrub habitat, coupled with the results of salt-spray penetration can result in disappearance of vegetative cover and instability of the dune system. This may mean that even partial clearing of the shrub-scrub habitat may result in eventual loss of the vegetative barrier, from ocean sprays and salt-borne winds.

If the shrub-scrub barrier is lost or cleared, the soil erosion rate can be expected to increase to the point where the combined effects of storm surges, hurricanes, heavy rains, and wind, could create a new ocean inlet into Back Bay that could cut through the hotel development site, and possibly sever the southern end of Sandbridge from the Refuge. Old maps of the area reveal that during the early 20th Century, an ocean inlet used to exist in that same vicinity. The City would then have the responsibility for constantly filling and repairing this "cut/inlet" following storms, or building a new bridge. In addition, the sudden influx of large volumes of salt water into Back Bay could cause harm to the freshwater ecosystem that now exists there.

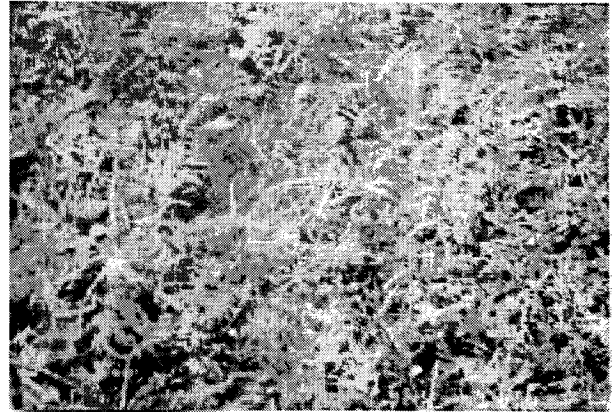
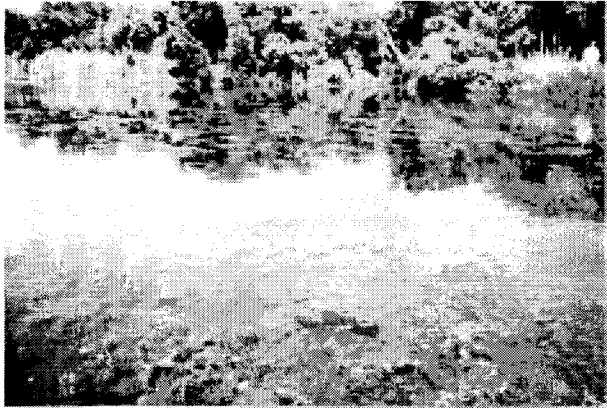


Photos #9: Former shrub-scrub that was cleared. Part of the proposed hotel development could be built here. Adjacent (south) to the cleared lot in this photo is a cross-sectional view of shrub-scrub habitat. This open, developed edge makes nesting Neotropical songbirds prone to brood-parasitism by cowbirds and predation.

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C. Potential Ecological Disruptions from Increased Recreational Use in Back Bay

The development of a resort hotel and accompanying recreational facilities, would also lead to increased public recreational use of Back Bay habitats. A primary concern of the Refuge is increased use by small boats and personal watercraft (i.e. jet skis and jet boats) within the Proclamation Boundary of Back Bay NWR. Such watercraft are able to navigate shallow Refuge waters that harbor good populations of submerged aquatic vegetation (SAV). They may cause damage to SAV by uprooting them before they seed. These plants are heavily fed upon by wintering migratory waterbirds and also provide cover and foods for resident fish and invertebrate populations. Refuge waterbird and fish populations serve as food for local raptor, wading bird, shorebird, and sea-bird species. Loss of the critical SAV element in the Back Bay ecosystem's food chain, will continue to decrease waterbird and fish use within the Back Bay NWR. The Refuge fears that increased use of the Refuge by recreational watercraft will degrade the quality of wildlife habitat and decrease migratory wildlife use of an historically heavily-used national wildlife resource.



Photos #10: Close-ups of SAVs growing in adjacent waters of Back Bay. Some SAV prefer freshwater. Changing the salinity in the bay could inhibit the growth of such salt-intolerant SAVs. Waterfowl, such as ducks, swans, and geese, feed on SAV, while many fish, amphibians, and invertebrates live within SAV beds.

Increased watercraft use will stir up bottom silt layers of the Bay and increase turbidity in the water column, further reducing the potential for SAV growth by reducing sunlight penetration to the Bay floor and inhibiting SAV seed germination. This decline of SAV, fish and waterbird populations may also decrease the sport hunting and recreational fishing value of the area, and possibly adversely impact the local tourist industry economy. Increased use by recreational watercraft will also increase shoreline erosion rates of the many Refuge Islands and Sandbridge's bay-shore, further increasing the turbidity and erosion problems that Back Bay is already experiencing.

D. Important Educational Tools and Opportunities

This final issue relates to educational opportunities and related research projects. Development of the shrub-scrub habitat will result in the loss of an outstanding Outdoor Classroom facility provided by Fairfax Community College Professor Rob Simpson. Professor Simpson has been operating a Mist-netting and Banding Station at Little Island City Park's Shrub-scrub habitats for 20 years or more. This station has provided not only an excellent source of migratory bird use data for the U.S. Fish & Wildlife Service and other professionals, but also an outstanding educational site for college students interested in a wildlife management career. Many rare bird and bat species have been discovered here. Members

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of the public have been permitted to visit and witness one of the largest mist-net banding projects along the East Coast. Loss of this advanced educational opportunity will occur with loss or modification of the local Shrub-scrub habitat. Disruption of this operation will disrupt this base-line survey station.



Photo #11: The Black and Yellow Argiope (*Acanthepeira aurantia*) spider is also a resident of local shrub-scrub habitat. They feed on insects trapped in its web, including biting flies, and are in turn, a food for resident songbirds and mammals.

V. Management Recommendations

Litvaitis et al. (1999) list several management recommendations for shrub-scrub habitat. Included in these recommendations are: 1) Manage this habitat in a landscape context. Landscape composition should include maintenance of moderate-sized patches, (greater than 10 hectares) in order to meet the needs of many avian and amphibian species. 2) Inform the public about the importance of shrub-scrub habitat for those species dependent on such early-successional habitats. 3) Maintain (remaining) shrub-land ecosystems.

Fernald (1989) recommends that shrub-scrub habitat be managed and studied under a “Regional Scrub Preserve System”, which can be established by local and/or regional governments. Bellis (1995) recommends that forest/shrub-scrub fragmentation be reduced, and that increased protection of shrub-scrub habitat be provided.

The Refuge recommends that the Shrub-scrub habitats along the western side of Sandpiper Road be left as is, and not be developed. Such educational and research losses cannot be recreated or replaced.

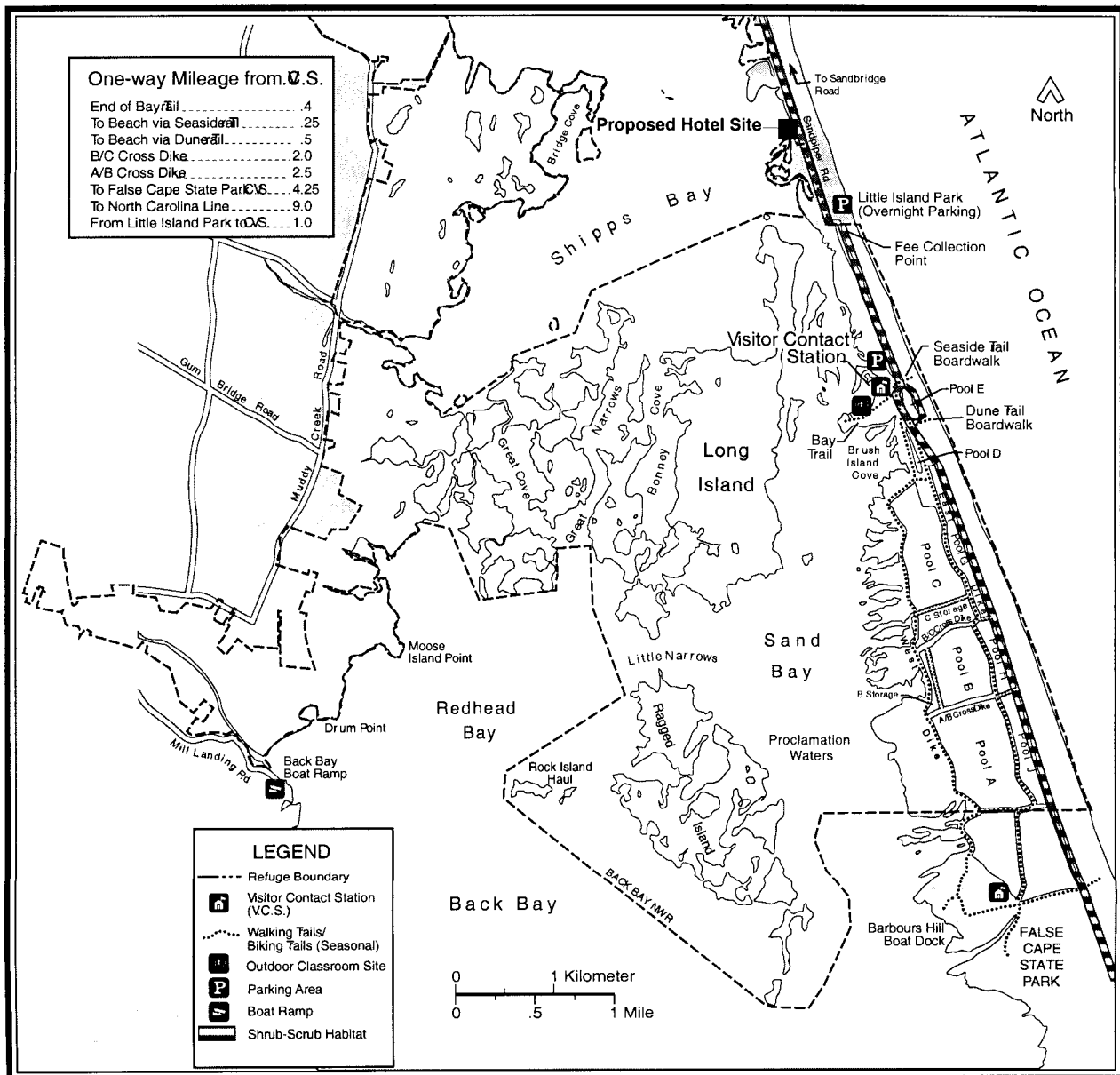
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Appendix #1 - Map of Back Bay National Wildlife Refuge



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Appendix #2 - 1998 Chincoteague and Back Bay National Wildlife Refuges Breeding Bird Checklist Within Shrub-Scrub Habitats

Killdeer	<i>Charadrius vociferus</i>
Northern Harrier	<i>Circus cyaneus</i>
Northern Bobwhite	<i>Colinus virginianus</i>
Mourning Dove	<i>Zenaida macroura</i>
Yellow-billed cuckoo	<i>Coccyzus americanus</i>
Chuck-will's-widow	<i>Caprimulgus carolinensis</i>
Yellow-shafted Flicker	<i>Colaptes auratus</i>
Downy Woodpecker	<i>Picoides pubescens</i>
Eastern Kingbird	<i>Tyrannus tyrannus</i>
Great Crested Flycatcher	<i>Myiarchus crinitus</i>
Eastern Wood-Pewee	<i>Contopus borealis</i>
Willow Flycatcher	<i>Empidonax traillii</i>
Tree Swallow	<i>Tachycineta bicolor</i>
Barn Swallow	<i>Riparia riparia</i>
Blue Jay	<i>Cyanocitta cristata</i>
Fish Crow	<i>Corvus ossifragus</i>
Carolina Chickadee	<i>Parus carolinensis</i>
Brown-headed Nuthatch	<i>Sitta pusilla</i>
House Wren	<i>Troglodytes aedon</i>
Carolina Wren	<i>Thyrothorus ludovicianus</i>
Gray Catbird	<i>Dumetella carolinensis</i>
Brown Thrasher	<i>Toxostoma rufum</i>
White-eyed Vireo	<i>Vireo griseus</i>
Red-eyed Vireo	<i>Vireo olivaceus</i>
Pine Warbler	<i>Dendroica pinus</i>
Yellow Warbler	<i>Dendroica petechia</i>
Ovenbird	<i>Seiurus aurocapillus</i>
Common Yellowthroat	<i>Geothlypis trichas</i>
Yellow-breasted Chat	<i>Icteria virens</i>
Northern Cardinal	<i>Cardinalis cardinalis</i>
Blue Grosbeak	<i>Guiraca caerulea</i>
Eastern Towhee	<i>Pipilo erythrophthalmus</i>
Field Sparrow	<i>Spizella pusilla</i>
Chipping Sparrow	<i>Spizella passerina</i>
Song Sparrow	<i>Melospiza melodia</i>
Fox Sparrow	<i>Passerella iliaca</i>
Eastern Meadowlark	<i>Sturnella magna</i>
Red-winged Blackbird	<i>Agelaius phoeniceus</i>
Brown-headed Cowbird	<i>Molothrus ater</i>
Common Grackle	<i>Quiscalus quiscula</i>
Boat-tailed Grackle	<i>Quiscalus major</i>
American Goldfinch	<i>Carduelis tristis</i>

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Appendix #3 - Frequency and relative abundance of breeding birds in shrub habitat, Chincoteague National Wildlife Refuge, Assateague Island, VA during BBS of June 16, 1998.

<u>Species</u>	<u>Frequency of Occurrence (%)</u>	<u>Relative Abundance</u>
Field Sparrow	83.3	12.6
Song Sparrow	73.3	10.9
Yellow Warbler	60.0	8.1
Fish Crow	20.0	7.7
Common Yellowthroat	56.7	7.0
Eastern Kingbird	36.7	6.0
Gray Catbird	36.7	5.3
Brown-headed Cowbird	26.7	4.9
Eastern Towhee	36.7	4.6
Willet	33.7	4.2
Boat-tailed Grackle	30.0	3.5
Red-winged Blackbird	26.7	3.5
American Goldfinch	20.0	2.8
Northern Bobwhite	26.7	2.8
Willow Flycatcher	23.3	2.5
Yellow-breasted Chat	20.0	2.1
Common Grackle	10.0	1.8
Tree Swallow	16.7	1.8
Barn Swallow	10.0	1.4
Eastern Meadowlark	10.0	1.1
Northern Harrier	10.0	1.1
Chipping Sparrow	6.7	0.7
Northern Cardinal	6.7	0.7
Brown Thrasher	6.7	0.7
Fox Sparrow	3.3	0.4
Pine Warbler	3.3	0.4
Great Crested Flycatcher	3.3	0.4
Carolina Wren	3.3	0.4
Killdeer	3.3	0.4
Blue Grosbeak	3.3	0.4
White-eyed Vireo	3.3	0.4